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An Adaptive Upper-limb Stroke Rehabilitation System

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Abstract

People having disability is not uncommon in the world that we live in today. The number kept on increasing each year. People with disability are either born with it or they may have suffered from stroke or other similar illness which result in losing motor function. With the increasing number of patients, rehabilitation centres are shortage of therapist to cater the overwhelming number of patients. It should be noted that therapy has to be done as early and as frequent as possible for it to be effective. This causes therapists to suffer from fatigue due to handling a large amount of patient daily to ensure all are treated. With the advancement of technology, various types of robots have been developed to help the disabled community. These exoskeleton robots typically operate alongside human limbs. Thus, a study in this field based on engineering concept is vital. It should be noted that rehabilitation robot is not replacing therapist but are built with the purpose of assisting. In this project, an upper limb robot is developed to help in the rehabilitation process. A controller is used to control the speed of the motors to which is important for therapy. In the process, the patients are required to complete the task given by the therapist accordingly. If the patient is able to move the upper limb voluntarily, the speed of the motor would decrease accordingly up to 50% of the actual speed. By decreasing the speed, naturally the muscle would resist the motion therefore it exercise the muscle by encouraging it to move more. © 2023 American Institute of Physics Inc.. All rights reserved.

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